## **Exemplar Problems**

Q32. The Balmer series in the hydrogen spectrum corresponds to the transition from  $n_1 = 2$  to  $n_2 = 3$ , 4,....... This series lies in the visible region. Calculate the wave number of line associated with the transition in Balmer series when the electron moves to n = 4 orbit. ( $R_H = 109677$  cm<sup>-1</sup>).

Sol. 
$$\overline{v} = R_H \left( \frac{1}{n_1^2} - \frac{1}{n_2^2} \right) \text{cm}^{-1}$$
  
=  $109677 \left( \frac{1}{2^2} - \frac{1}{4^2} \right) = 109677 \left( \frac{1}{4} - \frac{1}{16} \right)$   
=  $20564.44 \text{ cm}^{-1}$